

4,280,919 of Stoeckigt, *et al.*; and Japanese Patent Publication No. JP 07-303825 (hereinafter referred to as "JP '825")

However, in Paper No. 11, the Examiner rejects claims 10, 14-26 and 30 under 35 U.S.C. §103(a), as being unpatentable over GB '931. The Examiner contends that GB '931 teaches "nonionic surface active agents (surfactants) having a random mixture of oxypropylene and oxyethylene groups", citing several lines of pages 2 and 3, as well as Examples IV and V. (Paper No. 11, ¶ 4, page 2). The Examiner acknowledges that GB '931 fails to teach the claimed ranges of ethoxylation and propoxylation, but notes that GB '931 does teach a weight ratio of propylene oxide to ethylene oxide of from 0.85:1 to 2.75:1. The Examiner further contends that the weight ratio of propylene oxide to ethylene oxide in the pending claims is from 0.4:1 to 0.83:1. The Examiner argues that, "[t]he weight ratios of GB 1,172,931 and the instant invention are *close enough* that one having ordinary skill in the art would have expected them to produce the same results." (Paper No. 11, ¶ 4, page 2 (*emphasis added*)).

Additionally, in Paper No. 11, the Examiner rejects claims 10, 14-26 and 30 under 35 U.S.C. §103(a), as being unpatentable over JP '825. The Examiner contends that JP '825 teaches nonionic surfactants "obtained by random addition of, on an average, 5-15 moles of ethylene oxide and 0.3-5.0 moles of propylene oxide", citing pages 2 through 4 of the reference, as well as Table 1. (Paper No. 11, ¶ 5, page 3). The Examiner acknowledges that JP '825 fails to specifically exemplify the claimed ranges of ethoxylation and propoxylation, but argues that the teachings of a reference are not limited to the preferred embodiments. Thus, the Examiner further contends that ranges of ethoxylation and propoxylation disclosed in JP '825 overlap with the claimed ranges. Specifically, the Examiner contends that the claimed range of ethoxylation recited in the instant claims (*i.e.*, from about 3 to about 5) overlaps with the disclosed range of from 5 to 15, and that the claimed range of propoxylation recited in the instant claims (*i.e.*, from about 2 to about 2.5) overlaps with the disclosed range of from 0.3 to 5. The Examiner argues that, "where claimed ranges 'overlap or lie inside ranges disclosed by the prior art' a *prima facie* case of obviousness exists." (Paper No. 11, ¶ 5, pages 3-4 (citing *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990); and *In re Geisler*, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997)).

Each of the rejections under 35 U.S.C. §103(a), is based upon a single reference, and rests upon the Examiner's contention that the claimed invention differs from each of the cited references only in the ranges of ethoxylation and propoxylation claimed. The Examiner argues that "merely selecting proportions and ranges is not patentable absent a showing of criticality." (Paper No. 11, ¶¶ 11-14). Furthermore, in Paper No. 11, the Examiner argues that Applicants have failed to sufficiently rebut the alleged *prima facie* case of obviousness with the presentation of unexpected and advantageous results. The Examiner contends that the showing of unexpected and advantageous results presented in the Amendment filed on April 11, 2001, is unsatisfactory. Specifically, the Examiner contends that "a side-by-side comparison between the instant invention and the closest prior art of record, i.e., JP '825" is required, and the Examiner invites Applicants' attention to Section 716 of the M.P.E.P.

Applicants respectfully traverse the Examiner's rejections, and the arguments and contentions in support thereof, for the reasons set forth below. It is submitted that neither of the cited references satisfies the necessary criteria for establishing a *prima facie* case of obviousness. Moreover, even assuming for argument's sake that a *prima facie* case of obviousness could be established based upon the cited references, which it cannot, Applicants submit that the evidence presented in the Specification satisfactorily rebuts such an alleged *prima facie* case, and that further comparison, as requested by the Examiner, is not required.

To begin with, Applicants' claimed invention is directed to a mixture of polymers comprising random fatty alcohol alkoxylates according to the general formula (I):



wherein R^1 represents an alkyl group having from about 6 to about 22 carbon atoms, each EO represents $-CH_2CH_2O-$, each PO independently represents $-C(CH_3)HCH_2O-$ or $-CH_2C(CH_3)HO-$, and wherein n represents the average number of EO units present in each random fatty alcohol alkoxylate and has a value of from about 3 to about 5, and wherein m represents the average number of PO units present in each random fatty alcohol alkoxylate and has a value of from about 2 to about 2.5. Other embodiments are directed to processes for producing such mixtures of polymers and to concentrates containing such mixtures.

As indicated in Applicants' Specification, and as evidenced by the Examples set forth therein, mixtures of random fatty alcohol alkoxylates, in accordance with the claimed invention, surprisingly exhibit excellent low-temperature behavior, including significantly improved cold cloud points and cold water solubility. (See, Spec., at page 2, lines 18-20; at page 2, line 29, through page 3, line 1; and at page 4, lines 9-17).

In order to establish a case of *prima facie* obviousness based upon a single reference, each of the following three criteria must be established: (1) the reference must contain a teaching or suggestion which would motivate one of ordinary skill in the art to modify the reference as suggested by the Examiner (it is not sufficient to say that the reference can be combined without a teaching in the cited reference to suggest the desirability of such a modification); (2) there must be a reasonable expectation of success; and (3) the reference must teach or suggest each and every element of Applicants' claimed invention. (M.P.E.P. §2143).

Furthermore, Applicants note that, "[i]n the case where the claimed ranges 'overlap or lie inside ranges disclosed by the prior art' a *prima facie* case of obviousness exists." (M.P.E.P. §2144.05 (I), citing *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990)).

GB '931 is insufficient to establish a *prima facie* case of obviousness. GB '931 recites a weight ratio of oxypropylene to oxyethylene which neither overlaps, nor lies inside, the claimed ranges. The Examiner's assertion that the taught ratio is "close enough" is not sufficient where one of ordinary skill in the art would not expect such ranges to have the same properties. GB '93 fails to teach or suggest each and every element of the claims, and fails to provide one of ordinary skill in the art with either the motivation to modify its teachings or a reasonable expectation of successfully achieving Applicants' claimed invention.

GB '931 does not teach or suggest the claimed average number of ethoxylate and propoxylate groups. GB '931 teaches a mixture of compounds of the general formula R-O(A)H, wherein A represents a random mixture of oxypropylene and oxyethylene groups, wherein the weight ratio of oxypropylene to oxyethylene can be from 0.85:1 to 2.75:1, and preferably between 1.25:1 and 2.25:1. (See, GB '931, p. 2, lines 15-35; and p. 3, lines 19-30).

In fact, GB '931 specifically teaches that, " . . . the amount of oxides used is very important . . . [i]n order to obtain the products of [GB '931], it is important that the oxides be employed in a weight ratio of oxypropylene to oxyethylene of from 0.85:1 to 2.75:1, preferably between 1.25:1 and 2.25:1." (See, GB '931, p. 3, lines 17-23 (*emphasis added*)). As the reference specifically teaches that weight ratios within the disclosed range are required, one of ordinary skill in the art cannot reasonably be said to have expected equivalent performance outside of such a range.

Moreover, GB '931 only exemplifies oxypropylene to oxyethylene weight ratios of 2:1, 1.33:1, 1.72:1, 2:1, and 2:1. In each instance, the random alkoxylate contains more propoxylate groups than ethoxylate groups. Again, there is no teaching or suggestion which would lead one of ordinary skill in the art to expect similar properties outside of the taught ranges. Thus, the Examiner's argument that the disclosed ranges in GB '931 are "close enough" to the claimed ranges is insufficient to establish a *prima facie* case of obviousness.

Applicants submit that GB '931 fails to teach or suggest the claimed ranges of ethoxylation and propoxylation. GB '931 does not recite ranges of ethoxylation and propoxylation which overlap, lie inside, or "are close enough" to establish a *prima facie* case of obviousness. GB '931 also contains no teaching or suggestion which would motivate one of ordinary skill in the art to modify its teachings, as suggested by the Examiner, to arrive at Applicants' claimed invention. In fact, GB '931 teaches away from modifications outside its taught weight ratio, as discussed above. Finally, given this express teaching to stay within the taught weight ratio range, one of ordinary skill in the art would have no reasonable expectation of success in such a deviation.

Thus, it is submitted that GB '931 fails to satisfy any of the criteria necessary to establish a *prima facie* case of obviousness.

Applicants submit that JP '825 teaches nonionic surfactants which are obtained by the random alkoxylation of a predominantly saturated linear C₈₋₁₈ fatty alcohol with 5-15 moles of ethylene oxide and from 0.3-5 moles of propylene oxide. (See, JP '825 Trans, p. 2, section 0005). Applicants' claimed range of ethoxylation, (*i.e.*, from about 3 to about 5), appears to "touch" or just overlap, the taught range of "5-15", set forth in JP '825. However, Applicants'

claimed invention also recites a range of propoxylation which is from about 2 to about 2.5. While JP '825 also teaches an amount of propylene oxide of from 0.3-5.0 moles, the reference contains no teaching or suggestion to combine particular selected degrees of ethoxylation and propoxylation to arrive at a ratio which would fall within Applicants' claimed ranges. In fact, JP '825 teaches away from Applicants' claimed invention. JP '825 suggests that the surfactants contain at least 7 moles of ethylene oxide per fatty alcohol molecule. In the Examples of JP '825, the random alkoxylates (Ex. 1, 2, and 3) contain at least 8 moles of ethoxylate. Moreover, the disclosed degree of alkoxylation is much higher than the claimed invention wherein the combined average number of ethoxylate groups and propoxylate groups is from about 5 to about 7.5 (*i.e.* about 3 to about 5 plus about 2 to about 2.5). In the only reference to a molar amount of ethoxylate below 7 moles, (*i.e.*, Comparative Example 8), the ratio of propoxylate to ethoxylate is 0.25 to 1. JP '825 suggests much higher degrees of alkoxylation than the claimed random fatty alcohol alkoxylates, and moreover, a higher ratio of ethoxylate to propoxylate.

Applicants submit that JP '825 fails to suggest Applicants' claimed ranges of ethoxylation and propoxylation. While JP '825 does appear to teach molar amounts of ethoxylate and propoxylate which overlap the claimed ranges, JP '825 fails to render the pending claims *prima facie* obvious because the reference teaches away from the simultaneous selection of both claimed ranges.

Thus, Applicants submit that no *prima facie* case of obviousness can be established based upon the cited references, and that even assuming for argument's sake that a *prima facie* case of obviousness could be established based upon overlapping ranges, that any such *prima facie* case of obviousness is sufficiently overcome by a general teaching away from the claimed ranges in the cited references.

Finally, even if it were assumed, for argument's sake, that a *prima facie* case of obviousness could be established based upon any of the cited references, alone or in combination, which it cannot, any such *prima facie* case of obviousness is overcome by Applicant's showing of unexpected and advantageous results in terms of significantly improved low temperature behavior. Applicants additionally maintain that the evidence set forth in the

Specification sufficiently rebuts any alleged *prima facie* case of obviousness, and respectfully request reconsideration in this regard.

As set forth in the Specification, mixtures of random fatty alcohol alkoxylates, in accordance with the claimed invention, exhibit excellent low-temperature behavior, including significantly improved cold cloud points and cold water solubility. Moreover, this significant improvement is surprising. (See, Spec., at page 2, lines 18-20; at page 2, line 29, through page 3, line 1; and at page 4, lines 9-17).

In the Examples, which begin at page 6, line 13 of the Specification, random fatty alcohol alkoxylates, in accordance with the claimed invention are compared to block polymers with similar degrees of alkoxylation. As evidenced by the significantly lowered cloud points (-4°C and -14°C versus 1.5°C and 7.5°C) and the improved solubility in cold water, the random fatty alcohol alkoxylates, in accordance with the claimed invention outperform the low-temperature properties of other fatty alcohol alkoxylates.

The Examiner has argued that a "side by side" comparison in the form of a Declaration is necessary, under Section 716 of the M.P.E.P. Applicants respectfully submit, that Section 716 of the M.P.E.P does **not** require the submission of a "side-by-side" comparison in order to successfully establish unexpected results. Applicants respectfully submit, that section 716.02(a) simply outlines one requirement of a Declaration under 37 C.F.R. §1.132, namely that such a declaration compare the claimed subject matter with the closest prior art. However, section 716.02(b), which is more specifically related to the burden of proof concerning allegations of unexpected results, clearly indicates that both direct **and indirect** comparisons with the prior art may be made. Furthermore, the Federal Circuit has held that "the PTO **must** consider comparative data in the specification in determining whether the claimed invention provides unexpected results." (*In re Soni*, 34 USPQ.2d 1684, 1687 (Fed. Cir. 1995) (*emphasis added*), citing *In re Margolis*, 228 USPQ 940 (Fed. Cir. 1986)). The Federal Circuit also held that, "when an applicant demonstrates *substantially* improved results, . . . , and *states* that the results were *unexpected*, this should suffice to establish unexpected results *in the absence of* evidence to the contrary." (*Soni*, at 1688 (*emphasis in original*)).

Applicants submit that significantly improved results shown by indirect comparison, as set forth in the Specification, along with Applicants' statement that such improved results are unexpected, satisfy the required burden under Section 716.02(b) of the M.P.E.P. and *Soni*, absent evidence to the contrary.

As mentioned above, Applicants' Specification states that the significantly improved cold cloud points and cold water solubility achieved by the claimed invention are surprising. Furthermore, the results set forth in the Examples of the Specification clearly evidence significant improvement.

It is submitted that Applicants' showing of unexpected and improved results sufficiently rebuts any alleged *prima facie* case of obviousness. Therefore, withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

In view of the remarks set forth above and the amendments made herein, Applicants submit that all pending claims patentably distinguish over the prior art of record and known to Applicants, either alone or in combination. Accordingly, reconsideration, withdrawal of the rejections and a Notice of Allowance are respectfully requested.

Respectfully submitted,

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